Claims

[c1] 1. A device for treatment of a gas flow, the device comprising:
at least one body (3), at least one first opening (4, 4') for entrance of an incoming gas flow to said body (3) and at least one second opening (5, 5') for the exit of an outgoing gas flow from said body (3);
said body (3) comprising a plurality of gas flow passages (11a, 11b) arranged to permit heat exchange between the gas flows in adjacent passages;
at least one distribution section (26, 26') in communication with the first opening (4, 4') and with the gas flow passages (11a, 11b) to distribute the incoming gas flow to the gas flow passages (11a, 11b); and
at least one gas flow passage section (27, 27') including said gas flow passages (11a, 11b) and which is configured to permit heat exchange and to cause a conversion in the composition of the gas.

[c2] 2. A device as recited in claim 1, wherein the distribution section (26, 26') is configured to distribute the incoming gas flow within the individual gas flow passages (11a, 11b).

[c3] 3. A device as recited in claim 2, wherein the distribution section (26,26') is configured to bring about a substantially uniform gas flow within the individual gas flow passages (11a, 11b).

[c4] 4. A device as recited in claim 1, wherein the distribution section (26, 26') forms a part of the body (3).

[c5] 5. A device as recited in claim 1, wherein the distribution section (26, 26') is in communication with the second opening (5, 5') to lead the outgoing gas flow out from the gas flow passages (11a, 11b).

[c6] 6. A device as recited in claim 1, wherein the gas flow passages (11a, 11b)

extend essentially parallel to each other.

[c7] 7. A device as recited in claim 6, wherein the main direction of the gas flow in one gas flow passage (11a, 11b) is essentially the opposite of the main direction of the gas flow in at least one of the adjacent gas flow passages (11a, 11b).

[c8] 8. A device as recited in claim 7, wherein the gas flow passages (11a, 11b) further comprise inlet passages (11a) configured for conveying an incoming gas flow and outlet passages (11b) configured for conveying an outgoing gas flow, and a reversing zone (13) arranged so that gas entering said reversing zone (13) from the inlet passages (11a) is permitted to change direction and flow back through the outlet passages (11b).

[c9] 9. A device as recited in claim 8, wherein the reversing zone comprises a reversing chamber (13).

[c10] 10. A device as recited in claim 1, wherein the body (3) comprises a strip (1) folded into a zigzag structure (2), the spacer means (9) being arranged between the foldings (10) of the zigzag structure (2) in such a way that a distance is achieved between two foldings (10) that face each other in the zigzag structure (2), and said gas flow passages (11a, 11b) are thereby formed between the foldings (10) of the zigzag structure (2), and that said spacer means (9) are arranged to facilitate the distribution of the incoming gas flow in the distribution section (26).

[c11] 11. A device as recited in claim 1, wherein the body (3) comprises a strip (1) folded into a zigzag structure (2), a surface of the strip (1) at least partly exhibiting a three-dimensional pattern, said three-dimensional pattern being arranged to give rise to contact points and gaps between two foldings (10) that face each other in the zigzag structure (2), and the gas flow passages (11a,

11b) being formed in the gaps between the foldings (10) of the zigzag structure (2), and the surface of at least one of two foldings (10) that face each other differing from said three-dimensional pattern in the distribution section (26) in such a way that the distribution of the incoming gas flow is facilitated.

[c12] 12. A device as recited in claim 11, wherein a casing (6) is provided with said first opening (4) and said second opening (5) encloses the zigzag structure (2).

[c13] 13. A device as recited in claim 1, wherein the distribution section (26, 26') and the gas flow passage section (27, 27') form separate units arranged together in such a way that gas can flow from one section to the other with the distribution section (26, 26') and the gas flow passage section (27, 27') being joined to each other.

[c14] 14. A device as recited in claim 13, wherein the distribution section (26) comprises a wall structure forming: at least one first channel (29) to which the incoming gas flow is fed; and a plurality of second channels (30) that extend from said first channel (29) and which second channels (30) are open to the gas flow passages (11a, 11b) that are configured for an incoming gas flow.

[c15] 15. A device as recited in claim 14, wherein the first channel (29) is closed to the gas flow passages (11a, 11b).

[c16] 16. A device as recited in claim 14, wherein the wall structure forms a plurality of third channels (32) that are open to the gas flow passages (11a, 11b) that are intended for an outgoing gas flow, preferably said third channels (32) are formed between said second channels (30) using common walls.

[c17] 17. A device as recited in claim 13, wherein the distribution section (26') comprises a zigzag shaped wall structure forming a first and a second set of channels (40, 41), one set on each side of said zigzag shaped structure,

wherein said first set of channels (40) are open to the gas flow passages (11a, 11b) that are intended for an incoming gas flow and said second set of channels (41) are open to the gas flow passages (11a, 11b) that are intended for an outgoing gas flow, and wherein the incoming gas flow is fed to the first set of channels (40).

[c18] 18. A device as recited in claim 13, wherein the distribution section (26, 26') in at least one certain direction exhibits a substantially unchanged cross section.

[c19] 19. A device as recited in claim 18, wherein the distribution section (26, 26') is produced by extruding means.

[c20] 20. A device as recited in claim 13, wherein the distribution section (26, 26') and the gas flow passage section (27, 27') are made out of a ceramic material, and the sections are joined to each other by sintering means.

[c21] 21. A device as recited in claim 1, wherein the body (3) has a substantially cylindrical shape and the body (3) comprises an internal cavity (20) that extends in the longitudinal direction of the body (3), and that at least one first (4, 4') or second (5, 5') opening is directed towards said cavity (20) so that the gas flow at least partly is led via said cavity (20).

[c22] 22. A device as recited in claim 1, wherein the device comprises at least one filtering section (36), said filtering section (36) being adapted to remove particulates from the gas.

[c23] 23. A device as recited in claim 1, wherein at least a part of the surfaces in the body (3) that are in contact with the gas flow are coated with a catalyst material.

[c24] 24. A device as recited in claim 1, wherein at least a part of the surfaces in the body (3) that are in contact with the gas flow are coated with an

adsorption/desorption agent.

[c25] 25. A device as recited in claim 1, wherein the device comprises means for controlling the temperature of the gas flow in the body (3) and taking the form of at least one of (i) a heat generator arranged in the body (3), (ii) cooling flanges arranged in the body (3), (iii) an arrangement configured to introduce cooling air into the body (3), and (iv) a system for controlling the composition of the incoming gas flow.

[c26] 26. A device as recited in claim 25, wherein the system for controlling the composition of the incoming gas flow comprises at least one of (i) an arrangement for introduction of oxidizing species, such as air, into the incoming gas flow, and (ii) an arrangement for introduction of oxidizable species, such as hydrocarbons, into the incoming gas flow.

[c27] 27. A device as recited in claim 25, wherein the device is arranged in connection to a combustion engine, and said system for controlling the composition of the incoming gas flow comprises an arrangement for controlling the operation of the combustion engine, which operation in turn affects the composition of the incoming gas flow.

[c28] 28. A device as recited in claim 1, wherein the device is adapted to purify the exhaust gas from an internal combustion engine, preferably in a mobile application.

[c29] 29. A device as recited in claim 1, wherein the device is adapted to purify the exhaust gas from a mobile internal combustion engine.

[c30] 30. A device recited in claim 11, wherein said three-dimensional pattern is established as corrugations.

[c31] 31. A device recited in claim 21, wherein the body (3) has a general shape of a

circular cylinder.